General Biology

FLUORESCENCE LIFETIME IMAGING MICROSCOPY: A DIAGNOSTIC TOOL

Kristoff T. Homan, Robert Clegg*

Department of Physics
University of Illinois at Urbana-Champaign
1110 W. Green St., Urbana, IL 61801
khoman@uiuc.edu, rclegg@uiuc.edu

Fluorescent measurements of biological systems have used only intensity data in the past. Fluorescent lifetime information can yield greater insight into the systems being studied. We used this data to evaluate the health of soybean plants through analysis of the photosynthesis. Data obtained on water-stressed or Japanese beetle damaged soybean leaves are significantly and distinctly different compared to normal, healthy plant measurements. This study has demonstrated that fluorescent lifetime techniques can be used as a real-time, diagnostic tool to determine the health of plants.